

UNCLASSIFIED

AD _ 402 045 _

DEFENSE DOCUMENTATION CENTER

FOR

SCIENTIFIC AND TECHNICAL INFORMATION

CAMERON STATION, ALEXANDRIA, VIRGINIA



UNCLASSIFIED

NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

402045

21

STEP

AUTHOR:

TITLE:

PERIODICAL:

TEXT:

The influence of an external axial magnetic field κ upon the magnetic structure of a uniaxial ferromagnetic single crystal is investigated according to a quantum theoretical calculation method of the author (see Acta phys. Polon., 21, 175 (1962)). This method is based on minimizing the energy mean value

$$h = Q_1 + Q_2 \int \{ \dot{\varphi}^2 - \kappa^2 \cos^2 \varphi + q \cos \varphi \} dv \quad (10)$$

of a certain class of quantum states. Here φ denotes the angle of a rotation U by which the Hamiltonian H is transformed. φ is the solution of the equation of minimization

$$2\kappa^{-2} \ddot{\varphi} = \sin 2\varphi - q \sin \varphi : \quad (12)$$

$$\cos \varphi = (1 - \omega \sin t) / (\omega - \sin t). \quad (13)$$

Card 1/2

P/045/62/022/Supplement/007/014
B112/B186

Influence of an external axial ...

P/045/62/022/Supplement/007/014
B112/B186

ω is determined by the boundary conditions, which do not take into account the influence of the boundary domains of the single crystal. It is shown that an external magnetic field causes prevailingly a displacement of the Bloch walls in the interior of the crystal. The magnetization curve derived shows satisfactorily the well-known process of saturation. There are 6 figures.

ASSOCIATION: Institut für Theoretische Physik, Universität Wrocław
(Institute for Theoretical Physics, University of Wrocław)

SUBMITTED: April 9, 1962

Card 2/2